REMARKS

In the Office Action mailed on February 15, 2006, the Examiner rejected claims 1-29 under 35 U.S.C. 103. Claims 1, 16, and 22 have been amended. Applicants respectfully request reconsideration of the pending claims in view of the following remarks.

I. Claims 1-6, 11-14, and 16-29

The Examiner rejected Claims 1-6, 11-14, and 16-29 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,650,422 (the Singh reference) in view of U.S. Patent No. 6,192,103 (the Wormington reference).

In the Office action mailed on February 15, 2006, in responding to Applicants' arguments filed on January 6, 2006, with respect to claims 1, 16, and 22, the Examiner states that the transitional phrase in each of the independent claims is an open transitional phrase. Applicants assume that the Examiner is asserting that the open transitional phrase does not exclude the step of creating parameter vectors to create the diffraction signal, and that the calculated X-ray scattering is considered to be the second diffraction signal.

In response, Applicants assert that the arguments filed on January 6, 2006, do not assert that independent claims 1, 16, and 22 exclude the step of creating a parameter vector to create the diffraction signal. Instead, Applicants asserted that the Wormington reference fails to teach that a machine learning system is used to generate a simulated diffraction signal.

Note, claims 1, 16, and 22 recite that a second simulated diffraction signal is generated **using a machine learning system**. (Emphasis added.) Note also, claims 1, 16, and 22 have been amended to more clearly recite that the second simulated diffraction signal is generated "**as an output of the machine learning system**." (Emphasis added.)

In contrast, the Wormington reference discloses using a genetic algorithm, particularly an evolutionary algorithm, **to form a new parameter vector** from two parameter vectors (*see e.g.* col.

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3, lines 48-52) and **not a diffraction signal**. In particular, column 8, lines 3-7, discloses, "the adjustment of the model parameters at step 40, to obtain the best fit, is carried out with the use of genetic algorithms." As clearly depicted in FIG. 4, step 40 is performed after step 34 in which the simulation of the X-ray scattering is created based on the initial parameter vectors. As also clearly depicted in FIG. 4, after step 40 is performed, step 34 is iterated using the new parameter vector. Thus, the output of step 40, and thus the output of the genetic algorithm used to perform step 40, is a new parameter vector and not the simulation of the X-ray scattering.

Additionally, column 6, lines 15-18, discloses that in step 34 the X-ray scattering is simulated "using known methods such as those described in the aforementioned references." Column 2, lines 1-12, and column 5, lines 55-62 refer to various references as disclosing known methods for calculating X-ray scattering. The Examiner has not established that any of these known methods disclose using a machine learning system to generate the simulated X-ray scattering as an output of the machine learning system.

With respect to the Singh reference, the Examiner states that the Singh reference fails to disclose obtaining a second diffraction signal using a machine learning system, wherein the machine learning system receives as an input one or more parameters that characterize a profile of the structure to generate the second diffraction signal, recited in independent claims 1, 16 and 22.

Therefore, Applicants assert that claims 1, 16, and 22 are allowable because neither the Singh nor the Wormington reference, individually or in combination, teach or suggest using a machine learning system to generate a simulated diffraction signal as an output of the machine learning system. Additionally, Applicants assert that claims 2-6, 11-14, 17-21, and 23-29 are allowable for at least the reason that they depend on an allowable independent base claim.

II. Claim 9-10 and 15

The Examiner rejected claims 9-10, and 15 under 35 U.S.C. 103(a) as being unpatentable over the Singh reference in view of the Wormington reference and further in view of US Patent No. 6,665,446 (the Kato reference).

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The rejection of claims 9-10 and 15 should be withdrawn for at least the reason that they depend on an allowable independent base claim.

III. Claim 7

The Examiner rejected claim 7 under 35 U.S.C. 103(a) as being unpatentable over the Singh reference in view of the Wormington reference and further in view of EP Patent No. 0 448 890 (the Sirat et al. reference).

The rejection of claim 7 should be withdrawn for at least the reason that it depends on an allowable independent base claim.

IV. Claim 8

The Examiner rejected claim 8 under 35 U.S.C. 103(a) as being unpatentable over the Singh reference in view of the Wormington reference and further in view of Gahegan et al "Dataspaces as an organizational concept for the neural classification of geographic datasets", 1999.

The rejection of claim 8 should be withdrawn for at least the reason that it depends on an allowable independent base claim.

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V. Conclusion

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to withdraw the outstanding rejection of the claims and to pass this application to issue. If it is determined that a telephone conference would expedite the prosecution of this application, the Examiner is invited to telephone the undersigned at the number given below.

In the event the U.S. Patent and Trademark office determines that an extension and/or other relief is required, Applicants petition for any required relief including extensions of time and authorizes the Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to Deposit Account No. 03-1952 referencing docket no. 509982005500. However, the Commissioner is not authorized to charge the cost of the issue fee to the Deposit Account.

Dated: May 15, 2006

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